

IN THE CLAIMS:

1. **(Currently Amended)** An improved vehicle wheel service balancer system having a central processing unit and configured with a rotating support structure to support a vehicle wheel assembly ~~consisting of at least a vehicle wheel rim on a rotating support structure~~ during a vehicle wheel balancing procedure, the improvement comprising:

an imaging sensor assembly disposed to acquire at least one optical image of at least a portion of the vehicle wheel rim, said optical image consisting of a two dimensional array of pixel elements; and

wherein the central processing unit is configured to receive said acquired optical images from said imaging sensor assembly, and to utilize during a wheel balancing procedure, ~~said received images to identify~~ at least one distance measurement identified from said acquired optical image and which is associated with said imaged portion of the vehicle wheel rim.

2. **(Canceled)**

3. **(Cancelled)**

4. **(Cancelled)**

5. **(Cancelled)**

6. **(Cancelled)**

7. **(Currently Amended)** The improved vehicle wheel service balancer system of Claim 1 wherein the central processing unit is further configured to utilize said distance measurement to identify a surface profile of the vehicle wheel rim.

8. **(Cancelled)**

9. **(Currently Amended)** The improved vehicle wheel service balancer system of Claim 1 wherein said central processing unit is further configured to utilize said distance measurement to calculate radial runout about a circumference of a tire bead seat surface of the vehicle wheel rim.

10. **(Currently Amended)** The improved vehicle wheel service balancer system of Claim 1 wherein said central processing unit is further configured to utilize said distance measurement to calculate lateral runout about a circumference of the vehicle wheel rim.

11. **(Cancelled)**

12. **(Cancelled)**

13. **(Cancelled)**

14. **(Currently Amended)** The improved vehicle wheel service balancer system of Claim [[2]] 1 wherein the central processing unit is further configured to utilize said distance measurement to identify a miss-centered mounting of the vehicle wheel rim on a rotating support structure.

15. **(Withdrawn)** The improved vehicle wheel service system of Claim 1 wherein the central processing unit is further configured to utilize said distance information to identify the presence of an installed tire pressure sensor associated with the vehicle wheel assembly.

16. **(Cancelled)**

17. **(Currently Amended)** The improved vehicle wheel service balancer system of Claim 1 wherein the central processing unit is further configured to utilize said distance measurement to identify at least one feature of the vehicle wheel rim, said at

least one identified feature selected from a set of features which includes at least a spoke configuration and a spoke profile.

18. (Cancelled)

19. (Currently Amended) The improved vehicle wheel service balancer system of Claim 1 wherein the central processing unit is further configured to utilize said distance measurement to identify a wheel rim edge profile.

20. (Cancelled)

21. (Cancelled)

22. (Cancelled)

23. (Currently Amended) The improved vehicle wheel service balancer system of Claim 1 wherein the central processing unit is further configured to utilize said distance measurement to identify the presence of an imbalance correction weight installed on the vehicle wheel rim.

24. (Currently Amended) The improved vehicle wheel service balancer system of Claim 1 wherein the central processing unit is further configured to utilize said distance measurement to identify the presence of a wheel rim surface defect.

25. (Currently Amended) The improved vehicle wheel service balancer system of Claim 1 wherein the central processing unit is further configured to utilize said distance measurement to identify select at least one imbalance correction weight placement location on the vehicle wheel rim.

26. (Withdrawn) The improved vehicle wheel service system of Claim 1 further including at least one tire bead removal arm supporting a tire bead roller for operatively engaging the vehicle wheel assembly to displace a tire from the wheel rim,

and wherein said imaging sensor assembly is disposed on said at least one tire bead removal arm.

27. (Withdrawn) The improved vehicle wheel service system of Claim 25 wherein said imaging sensor assembly is disposed on said at least one tire bead removal arm adjacent said tire bead roller, and wherein said imaging sensor assembly has a field of view including a portion of a vehicle wheel rim tire bead seat exposed during operative engagement between said tire bead roller and the vehicle wheel assembly.

28. (Cancelled)

29. (Cancelled)

30. (Currently Amended) The improved vehicle wheel service balancer system of Claim 1 wherein the central processing unit is further configured to utilize said distance measurement to alter a configuration of one or more components of the improved vehicle wheel service system.

31. (Cancelled)

32. (Withdrawn) The improved vehicle service system of Claim 30 further including a pair of tire bead removal arms each supporting a tire bead roller for operatively engaging the vehicle wheel assembly to displace a tire from the wheel rim, and wherein said central processor is further configured to utilize said distance information to position each of said tire bead removal arms such that said associated tire bead rollers operatively engage the vehicle wheel assembly.

33. (Withdrawn) The improved vehicle wheel service system of Claim 32 wherein the central processing unit is further configured to alter an engagement of said

tire bead rollers with said vehicle wheel assembly responsive to said distance information indicative of the presence of a wheel assembly feature.

34. (Withdrawn) The improved vehicle wheel service system of 33 wherein said wheel assembly feature is a valve stem.

35. (Withdrawn) The improved vehicle wheel service system of 33 wherein said wheel assembly feature is an installed tire pressure sensor.

36. (Previously Presented) An improved wheel parameter measurement apparatus for a dynamic wheel balancer having a spindle shaft for mounting a vehicle wheel assembly consisting of at least a vehicle wheel rim for rotation thereon, the improvement comprising:

an optical energy sensing means for receiving reflected optical energy from an area of the vehicle wheel rim on the spindle, and for generating a two-dimensional image of said detected optical energy, said two-dimensional image composed of a plurality of image pixels; and

a processing means for receiving said images generated by said optical energy sensing means to extract data relating to at least one feature of the wheel rim.

37. (Previously Presented) The improved wheel parameter measurement apparatus of claim 36 wherein said extracted data identifies a feature location on the mounted wheel rim.

38. (Previously Presented) The improved wheel parameter measurement apparatus of claim 36 wherein said extracted data identifies a feature dimension on the mounted wheel rim.

39. (Previously Presented) The improved wheel parameter measurement apparatus of claim 36 wherein said extracted data identifies a configuration of said at least one feature on the mounted wheel rim.

40. (Cancelled)

41. (Cancelled)

42. (Cancelled)

43. (Cancelled)

44. (Currently Amended) A method for ~~measuring~~ characterizing at least one feature of a vehicle wheel assembly consisting of at least a vehicle wheel rim where the vehicle wheel assembly is mounted for rotational movement about an axis on a vehicle wheel service balancer system comprising the steps of:

detecting reflected optical energy from a three-dimensional area of the vehicle wheel rim;

generating a two-dimensional image of said three-dimensional area of the vehicle wheel rim from said detected optical energy, said two-dimensional image composed of a plurality of image pixels;

processing said generated image to extract data associated with at least one feature of the vehicle wheel rim; and

utilizing said extracted data during a wheel imbalance service procedure.

45. (Cancelled)

46. (Cancelled)

47. (Cancelled)

48. (Cancelled)

49. (Currently Amended) The vehicle wheel service balancer system of Claim 1 wherein said imaging sensor assembly is configured to acquire stereoscopic images of said portion of the vehicle wheel rim.

50. (Cancelled)

51. (Cancelled)

52. (Cancelled)

53. (Cancelled)

54. (Cancelled)

55. (Cancelled)

56. (Cancelled)

57. (Cancelled)

58. (Cancelled)

59. (Cancelled)

60. (Cancelled)

61. (Previously Presented) The improved wheel parameter measurement apparatus of Claim 36 wherein said optical energy sensing means is configured to acquire stereoscopic images of said area of the vehicle wheel rim.